CW - Exeter Math

Name _____

Analyze It

Date _____ Block _____

1. You are already familiar with operations involving positive numbers, but much mathematical work deals with negative numbers. Common uses include temperatures, money, and games. It is important to understand how these numbers behave in arithmetic calculations. First, consider addition and subtraction. For each of the following, show how the answer can be visualized using a number-line diagram:

(a) The air temperature at 2 pm was 12°. What was the air temperature at 8 pm, if it had dropped 15° by then?

(b) Telescope Peak in the Panamint Mountain Range, which borders Death Valley, is 11045 feet above sea level. At its lowest point, Death Valley is 282 feet below sea level. What is the vertical distance from the bottom of Death Valley to the top of Telescope Peak?

(c) In a recent game, I had a score of 3. I then proceeded to lose 5 points and 7 points on my next two turns. On the turn after that, however, I gained 8 points. What was my score at this moment in the game?

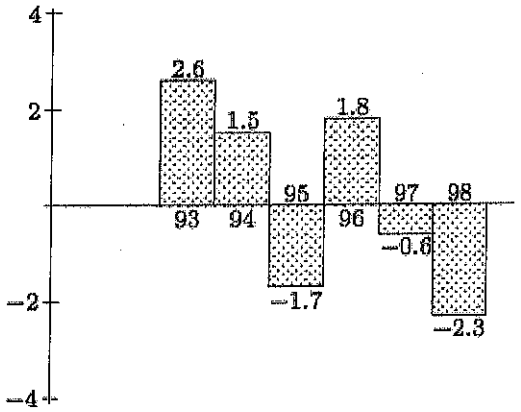
2. Profits and losses for the Whirligig Sports Equipment Company for the six years indicated are graphed on the chart at the right. The vertical scale is in millions of dollars. What was the change in profit and losses from

(a) 1993 to 1994?

(b) 1994 to 1995?

(c) 1997 to 1998?

For the six years graphed, did the company make an overall profit or sustain an overall loss? How much was the net change?



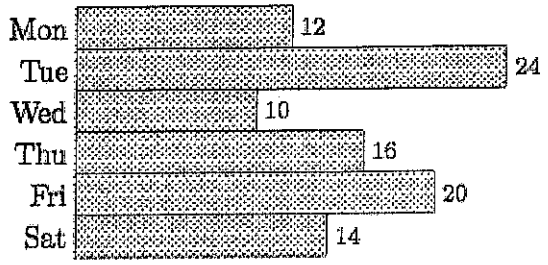
3. Pick any number. Add 4 to it and then double your answer. Now subtract 6 from that result and divide your new answer by 2. Write down your answer. Repeat these steps with another number. Continue with a few more numbers, comparing your final answer with your original number. Is there a pattern to your answers?

4. Put the numbers in order from least to greatest.

(a) 3.03 **(b)** 3.303 **(c)** 3.033 **(d)** 3.333 **(e)** 3.33

Using Charts

1. Jess and Taylor go into the cookie-making business. The chart shows how many dozens of cookies were baked and sold (at \$3.50 per dozen) during the first six days of business.



(a) What was their total income during those six days?

(b) Which was more profitable, the first three days or the last three days?

(c) What was the percentage decrease in sales from Tuesday to Wednesday? What was the percentage increase in sales from Wednesday to Thursday?

(d) Thursday's sales were what percent of the total sales?

(e) On average, how many dozens of cookies did Jess and Taylor bake and sell each day?

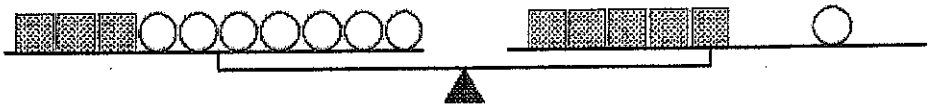
2. The length of a certain rectangle exceeds its width by exactly 8 cm, and the perimeter of the rectangle is 66 cm. What is the width of the rectangle? Although you may be able to solve this problem using a method of your own, try the following approach, which starts by guessing the width of the rectangle. Study the first row of the table below, which is based on a 10-cm guess for the width. Then make your own guess and use it to fill in the next row of the table. If you have not guessed the correct width, use another row of the table and try again.

guess	*length*	*perimeter*	*target*	*check?*
10	$10+8=18$	$2(10)+2(18)=56$	66	no

Now use the experience gained by filling in the table to write an equation for the problem: Write w in the *guess* column, fill in the length and perimeter entries in terms of w, and set your expression for the perimeter equal to the target perimeter. Solve the resulting equation. This approach to creating equations is called the *guess-and-check* method.

Familiar Things in Unfamiliar Ways

1. Use the *balance diagram* below to find how many marbles it takes to balance one cube.



2. (Continuation) Using c to stand for the weight of one cube and m for the weight of one marble, write an equation that models the picture in the previous problem. Use this equation to find how many marbles it takes to balance one cube.

3. Which of the following eight expressions does not belong in the list?

$a-b+c$ $c-b+a$ $c-(b-a)$ $-b+a+c$ $c+a-b$ $a-(b-c)$ $b-(c-a)$ $a+c-b$

4. Using the four integers 2, 3, 6 and 8 once each — in any order — and three arithmetic operations selected from among addition, subtraction, multiplication, and division, write expressions whose values are the target numbers given below. You will probably need to use parentheses. For example, to hit the target 90, you could write $90 = (3+6)\cdot(8+2)$.

(a) 3 (b) 24 (c) 36 (d) 30

Number Games

1. Choose any number. Double it. Subtract six and add the original number. Now divide by three. Repeat this process with other numbers, until a pattern develops. By using a variable such as x in place of your number, show that the pattern does not depend on which number you choose initially.

2. Jess takes a board that is 50 inches long and cuts it into two pieces, one of which is 16 inches longer than the other. How long is each piece?

3. Form three numbers of your choosing between 1 and 10 using the four integers 1, 2, 3, and 4 exactly once each and three arithmetic operations from among addition, subtraction, multiplication and division. You may also use parentheses and an operation may be used more than once. Extra credit if you can create more than three numbers!

Reflection

1) Which of the Math thinking standards (#1-8) did you use today? Explain your answer.

2) What skills did you improve/use/build on today?

3) Which problem today made you think the hardest? Why? (List the section and problem number)